

TERMS OF REFERENCE FOR THE APPOINTMENT OF A SERVICE PROVIDER TO DEVELOP A DETAILED FINANCING MODEL FOR THE RADIOACTIVE WASTE MANAGEMENT FUND, FOR A PERIOD OF 12 WEEKS

1 BACKGROUND

- 1.1 In accordance with the Radioactive Waste Management Policy and Strategy of 2005, the Radioactive Waste Management Fund (RWMF) should be established. The main objective Fund is to ensure that the money is available as and when required throughout the life of the National Radioactive Waste Disposal Institute and associated facilities. It must also be ensured that all costs must also allocated fairly and that value-for-money is optimised.
- 1.2 The Policy was followed by promulgation of the National Radioactive Waste Disposal Institute Act, 53 of 2008 (the Act). The Act establishes the National Radioactive Waste Disposal Institute (NRWDI).
- 1.3 Prior to the Act coming into operation, the South African Nuclear Energy Corporation (Necsa) was responsible for the management of radioactive waste and the operation of Vaalputs through section 55(2) of the Nuclear Energy Act, the authorized national radioactive waste disposal facility.
- 1.4 Based on the NRWDI Act, a diagrammatic representation of the expected income for the National Radioactive Waste Disposal Institute is shown in the figure below.

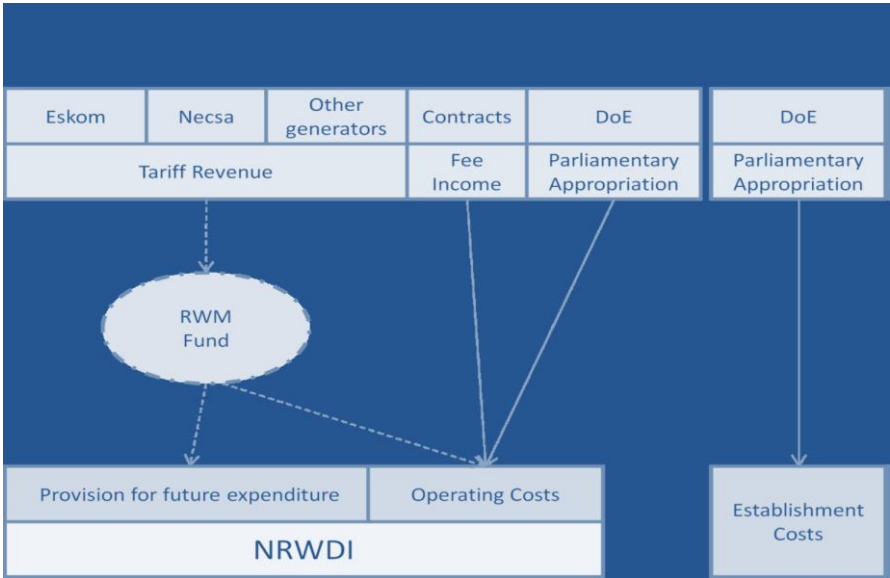


Figure 1: Sources of funding

- 1.4 The NRWDI expects to receive the following sources of funds either directly or through the RWMF:
 - 1.4.1 Levy from nuclear power generation/ electricity production (c/kWh);

- 1.4.2 Seed capital from the fiscus;
- 1.4.3 Income from the provision of certain services (consulting, Research & Development);
- 1.4.4 Investment income from the Radioactive Waste Management Fund; and
- 1.4.5 Levy from operation of research reactors (c/kWhr thermal)
- 1.4.6 Lump sum grants for past strategic facilities radioactive waste decommissioning and decontamination
- 1.4.7 Through a tariff system applied to different categories of waste at the time of delivery to interim storage; and Fees for waste disposal from small waste generators such as medical facilities, mining companies, research institutions, and other waste generators.
- 1.5 From these budgetary sources, the following costs are expected:
 - 1.5.1 Establishment costs of NRWDI (for the first 1 to 4 years): Head office cost, including developing and maintaining a national radioactive waste inventory system, R&D and stakeholder support (i.e. costs for activities associated with stakeholder and regulatory support and involvement at sites);
 - 1.5.2 Fixed and variable waste disposal operating costs (Vaalputs), including support services;
 - 1.5.3 Capital cost for process and infrastructure expansion;
 - 1.5.4 Construction projects (e.g., feasibility, design, construction, commissioning, etc.) associated with establishment of a High Level Waste site;
 - 1.5.5 Costs for post-closure long-term care and maintenance of disposal sites; and
 - 1.5.6 Costs/Provision for “historic” liabilities or ownerless waste (e.g., where there is no legal owner of radioactive waste or disused sealed radioactive sources).
- 1.6 Through a series of consultations with the National Treasury, it was indicated that the Department of Energy needs to develop the financial model for the collection of levy and the tariff/user charge for the management of radioactive waste throughout the lifecycle of the waste disposal facility.
- 1.7 This model is necessary in order to meet the targets of the Department Annual Performance Plan, namely “Radioactive Waste Management Fund Bill sent to the Chief State Law Advisor & submitted to Cabinet for public comment.”

2 OBJECTIVES

2.1 The objectives of the study are:

2.1.1 To develop a financial model that would assist the Department to more accurately estimate the cost of nuclear waste disposal.

2.1.2 Estimate the tariffs required from nuclear waste generators in order to ensure the “polluter pays principle” is implemented successfully.

3 SCOPE OF WORK

3.1. The service provider is expected to deliver the work through four (4) phases. The final product would be a collation of each of these into a coherent and internally consistent recommendation. The phases are Benchmarking and Options Studies, Assessment, Modelling and Analysis, Recommendations. The service provider is expected to address adequately as a minimum the following:

3.1.1. **Benchmarking and Options Studies:** A historical overview of the various financing models utilised to finance radioactive waste management and disposal in other countries. By extension, a description of any additional options not implemented previously that could be considered for South Africa should be given. Details of each financing models and costs investigated should include the following:-

a. Input variables to be considered for the financing model of radioactive waste management and disposal of waste from power generation (using Pressurised Water Reactor), research reactors, Institutional waste, and other waste (e.g. medical waste). i.e. cost of nuclear waste management must be provided from the countries studied.

b. Lessons learned, successes and failures and the reasons thereto with regards to payments into the Funds from time of a policy decision to establish and operationalise the Funds to the current structure (i.e. an evolution of the financing structure).

c. At least the following country models must be studied: Turkey, Russian Federation, South Korea, Japan, China, United States of America, France, Brazil, India, Taiwan, Germany, Finland, Sweden, Poland, Lithuania, Canada, Switzerland and Spain.

3.1.2 **Assessment:** A comparative **assessment** of each of the various financing structures derived from the benchmarking and options phase, as it relates to their adoption, use and potential impact within the South African environment.

a. An outline of the pros and cons of each of the options with reference to the financial regulatory and legislative framework of South Africa should be included.

b. The assessment should be based on the international experience, lessons learned, successes and failures and the reasons thereto.

- c. The Service Provider must provide a description of the international experience to address the regulatory tariff risk that may occur due to the establishment of the Fund. By extension, this should be based on previous scenarios and incorporate the lessons learned, successes and failures and the reasons thereto, and recommend solution/s.
- d. From this, there should be a recommendation on the South African nuclear waste tariff determination process.

3.1.3 **Modelling and Analysis** – The service provider must develop a quality assured financial modelling tool that would enable cost calculation of the management of waste throughout the lifecycle of the waste disposal facility/facilities. This should consider the three types of nuclear waste (i.e. low-level, intermediate level, and high-level waste).

- a. The model must be based on the complete construction and operation lifetime of the radioactive waste disposal facilities. This should consider that Vaalputs is already an operational facility.
- b. The model must cover the complete management of the nuclear waste from the receipt/ acceptance to complete remediation of the disposal sites.
- c. Waste would include the current nuclear operations as well as the envisaged 9.6GWe for the complete nuclear build programme. The model should also allow flexibility in terms of the size of the nuclear power programme.
- d. The model should consider categorising input costs as fixed and variable. Fixed costs will apply to the Vaalputs facility and are not dependent on the type or amount of waste disposed, and should include pre-operational safety assessment and licensing costs, initial repository construction, and environmental monitoring.
- e. The input cost estimate for each category of waste should be based on best estimate values for individual cost items, using a deterministic calculation, with a contingency amount to cover uncertainty in that estimate.
- f. The input cost estimate should be presented in the form of a cost distribution over time, with total costs being sub-divided according to the year and to the main cost categories, as shown schematically in figure 2 and 3 below.

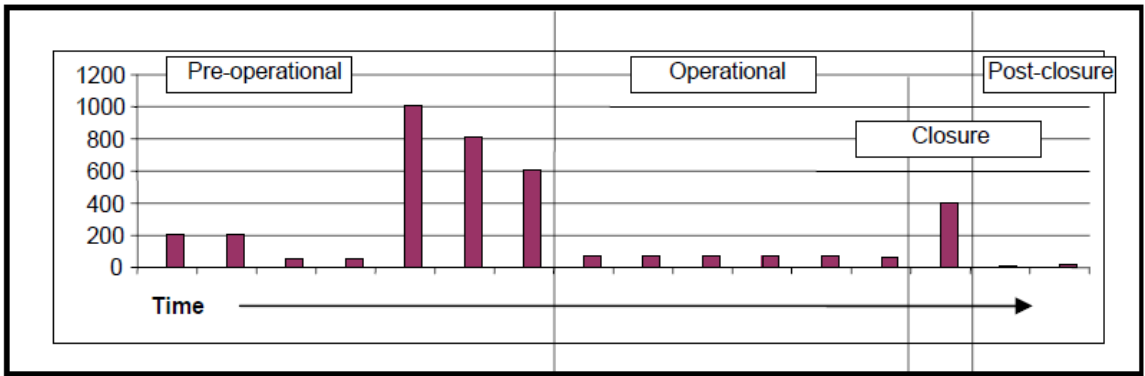


FIG. 2. Illustrative cost profile (total cost).

| Cost Categories | Time | | | | | | | | | | | | | | | |
|-----------------|------|-----|----|----|------|-----|-----|---|----|----|----|----|----|-----|---|----|
| 1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 2 | 200 | 200 | | | | | | | | | | | | | | |
| 3 | | | 50 | 40 | 400 | 800 | 600 | | | | | | | | | |
| 4 | | | | | 600 | 800 | 600 | | | | | | | | | |
| 5 | | | | | | | | 6 | 60 | 60 | 60 | 60 | 40 | | | |
| 6 | | | | | | | | | | | | | | 400 | | |
| 7 | | | | | | | | | | | | | | | 5 | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | 10 | | | | | | | | | 10 | | | |
| | 208 | 208 | 58 | 58 | 1008 | 808 | 608 | 6 | 68 | 68 | 68 | 68 | 50 | 400 | 5 | 13 |

FIG. 3. Illustrative cost profile (by main cost category).

- g. The Service Provider should also present the model to give projection of funding cost over time as follows:

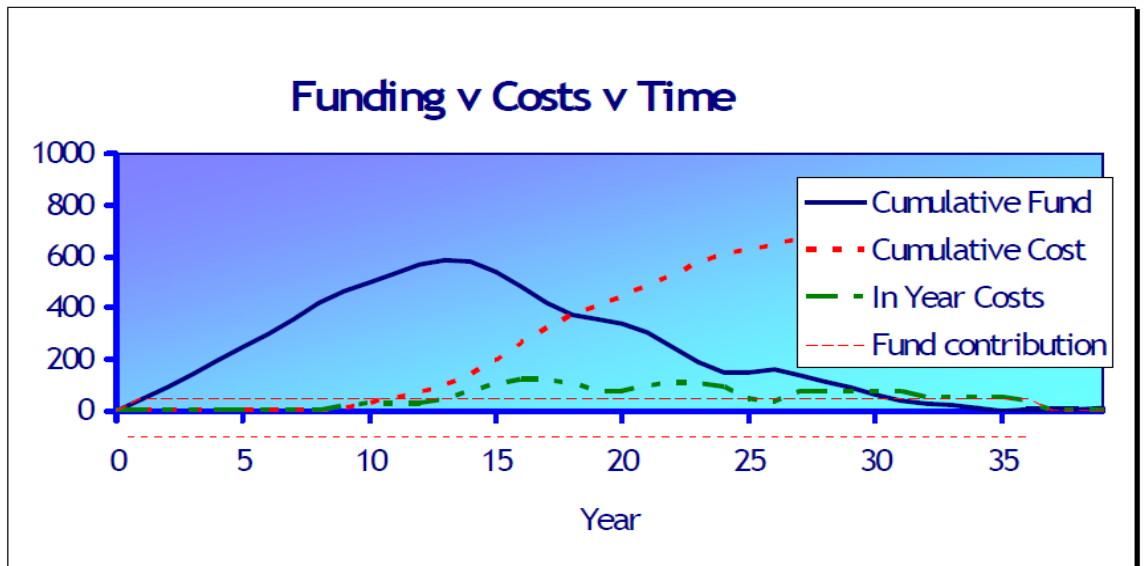


FIG. 4. Illustrative time projection of funding costs.

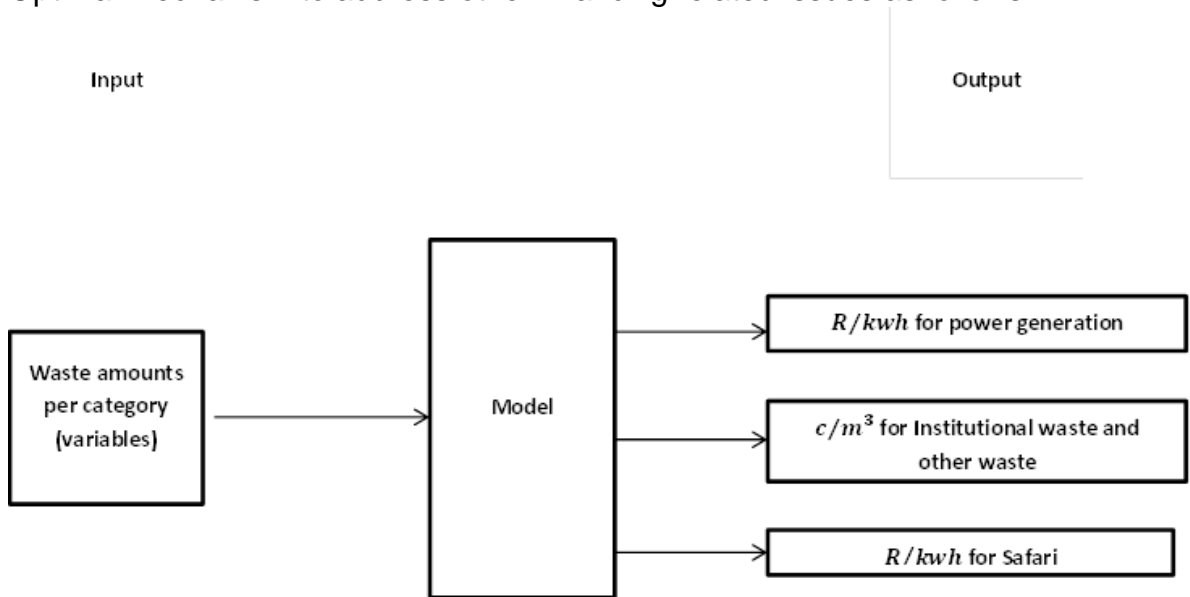
- h. Key inputs of the model:
 - (i) Nuclear power generation (units GWhr/annum) for the period 1985 – 2100

- (ii) Research power generation (units: MWhr/annum) for the period 1965 – 2100
 - (iii) Institutional waste (*units: m³/annum*) for the period 1985 – 2100
 - (iv) Other waste from activities of medical, research, etc. (*units: m³/annum*) from the period 1985 – 2100.
- i. Input variables for the calculation should include variables such as
 - (i) Debt financing costs
 - (ii) Debt financing periods
 - (iii) Debt/Equity Ratio
 - (iv) Construction period Estimated total disposable waste inventory at post closure of the repository
 - (v) Estimated annual disposable waste inventory waste
 - (vi) Yearly S-Curve proportions for life cycle of the facilities
 - (vii) Inflation Rates per year for the complete waste disposal facilities lifetime
 - j. The primary output of the model should be a numeric and graphical illustration of the cost of management and disposal of radioactive waste on a per year basis, including the end-of-life decommissioning, clean-up and post-closure care and maintenance activities.
 - k. In addition an output of key financial ratios, gross and net cash flows, a levelised cost calculation output, and breakeven smoothed tariff of the waste generator is required for each type of waste scenario.
 - l. The three types of waste scenarios (i.e. high-level, intermediate-level, and high-level) must be modelled using the abovementioned tool with the salient outputs of each captured in a comparative chart or table. The impact of each type of waste scenario on the fiscus, investors, and lenders must also be clearly quantified. This should include the timetable for the waste repository life cycle phases.
 - m. The key outputs of the model in terms of costs should be the best estimate or average, and should be categorised as follows:
 - (i) Nuclear power generation: cost/GWhr/annum
 - (ii) Research power generation: cost/MWhr/annum
 - (iii) Institutional waste: (*cost / m³/annum*)
 - (iv) Other waste: (*cost / m³/annum*)
 - n. The reference scenario(s) of the types of waste for the cost calculation should comprise of the life cycle of the disposal facilities. It should also include the assumed annual throughput of wastes.
 - o. Any model sensitivities, uncertainties and risks that may arise as a result of technical issues (e.g., early site closure) as well as non-technical issues (e.g., socio-economic factors, regulatory requirements, etc.) that may impact on funding estimates and utilisation must be noted.
 - p. The service provider must provide access to all the formulae, sheets, and source code for the model which would allow the Department to

independently verify, validate or further develop or enhance the model at a later stage.

3.1.4 **Recommendations** - From the assessment and analysis, an internally consistent **recommendation(s)** should be made on the following:

- a. Optimal financing structure including how risks should be apportioned and allocated.
- b. Optimal sources (including source quantities) of financing.
- c. Optimal mechanism to address other financing related issues as follows:



- d. Optimal financing implementation strategy
- e. Conduct a benchmark on the method of collecting funds based on the different types of waste streams.
- f. The model should be easily understood and transparent; should be based within IAEA principles and South African laws.

4 PAYMENTS

- 4.1 The Department will not make an upfront payment to a successful service provider. Payment will only be made in accordance to the delivery of service that will be agreed upon by both parties and upon receipt of an original invoice.

5 REPORTING REQUIREMENTS AND PROGRESS MEETINGS

- 5.1 It is envisaged that the DoE will require an initial meeting with the successful service provider to agree on the project process and options to be investigated. Bi-weekly meetings will then follow to discuss the progress of the project until completion.

- 5.2 Progress meeting feedback shall be held as and when necessary, but at least three times for a period of 12 weeks. The venue for these meetings will be at **Matimba Building, 192 Visagie Street, Pretoria**-the DoE Head Office (Pretoria). Representatives from the service providers' organisation shall be obliged to attend at their own costs. Where applicable, conference calls shall be held to facilitate such meetings.
- 5.3 Progress reports shall be submitted to the Mr Katse Maphoto: Chief Director (Nuclear Safety and Technology) prior to meetings and will be in the form of Microsoft PowerPoint™ slides and Microsoft Word™ reports. Calculation models are to be done in Microsoft Excel™ .

6 DOCUMENTATION

- 6.1 For all the identified milestones of the project, the successful service provider shall submit two (2) copies of progress reports after completion of each phase. The progress reports shall be organised in a systematic way, with adequate indexing. The progress reports shall contain all documents produced including copies of minutes of meetings.
- 6.2 The copyright in the end product will vest in DoE and be presented with its logo, and it will be at liberty to use the report and results as deemed necessary.

7 COMPLETION DATE

- 7.1 The duration of the project is 12 weeks after signing of the contract with the successful service provider.

8 TAX CLEARANCE CERTIFICATE

- 8.1 The selected service provider is required to submit an original and valid Tax Clearance Certificate issued by the South African Revenue Services together with the bid documents before the closing date and time of the bid. **Failure to comply with this condition will invalidate the bid.**

9 CONFIDENTIALITY OF INFORMATION

- 9.1 The names of all the members of the service provider team must be disclosed for the prior approval of DoE. Any changes, replacements and additions should be submitted for prior approval of DoE.
- 9.2 All members will have to sign a Non-Disclosure Agreement before project commencement, and may be required to undergo security screening and tests as the DoE deems necessary.

10 TERMS AND CONDITIONS

- 10.1 DoE reserves the right to exclude any member whom DoE deems, at its own discretion. In this case the service provider will be requested to replace the excluded member with another suitable candidate. The replacement candidate must submit the above mentioned resume and declaration and be approved by DoE in writing.
- 10.2 The service provider shall disclose all information in its proposal regarding any interests that may result in an actual or perceived conflict of interest.
- 10.3 Please note that DoE reserves the right to disqualify any service provider in circumstances where a conflict of interest exists or is perceived to exist or where a service provider has failed to disclose any conflict of interest or any other material information that may have affected the award of the service.

11 COMPULSORY INFORMATION SESSION

- 11.1 A compulsory information session will be held on **01 December 2015** at the Department of Energy, Corner Visagie and Paul Kruger Streets; Pretoria at 10H00.

12 EVALUATION METHODOLOGY

12.1 COST

- 12.1.1 The service provider will be requested to provide a quote regarding the work to be undertaken for this project.
- 12.1.2 The total cost must be VAT inclusive and should be quoted in South African currency (i.e. rands).
- 12.1.3 The service provider should provide hourly rates as prescribed by Department of Public Service and Administration (DPSA), Auditor- General (AG) or the body regulating the profession of the consultant.
- 12.1.4 The service Provider should provide (S&T) rates that are in aligned to the National Treasury instruction note as follows:
- i) Hotel Accommodation – R1300 per night per person, including breakfast, dinner and parking
 - ii) Air travel must be restricted to economy class
 - iii) Claims for kilometres may not exceed the rates approved by the Automobile Association of SA.

12.2 BROAD BASED BLACK ECONOMIC EMPOWERMENT

- 12.2.1 Provisions of the Preferential Procurement Policy Framework Act (PPPFA) 2011 and its regulation will apply in terms of awarding points.

12.2.2 Bidders are required to submit original and valid B-BBEE Status Level Verification Certificates or certified copies thereof together with their quotes, to substantiate their B-BBEE rating claims.

12.2.3 Bidders who do not submit their B-BBEE status level verification certificates or are non-compliant contributors to B-BBEE will not qualify for preference points for B-BBEE.

12.2.4 A trust, consortium or joint venture must submit a consolidated B-BBEE status level verification certificate for every separate bid.

12.2.5 Accounting Officers must ensure that the B-BBEE Status level Verification Certificates submitted are issued by the following agencies:

12.2.5.1 Bidders other than EMEs

- (a) Verification agencies accredited by SANAS
- (b) Registered auditors approved by IRBA

12.2.5.2 Bidders who qualify as EMEs

- (a) Accounting officers as contemplated in the CCA; or
- (b) Verification agencies accredited by SANAS; or
- (c) Registered auditors (Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates).

12.2.5.3 The table below depicts the B-BBEE status level of contribution:

| B-BBEE Status Level of Contributor | Number of points (90/10 system) |
|-------------------------------------------|----------------------------------------|
| 1 | 10 |
| 2 | 9 |
| 3 | 8 |
| 4 | 5 |
| 5 | 4 |
| 6 | 3 |
| 7 | 2 |
| 8 | 1 |
| Non-compliant contributor | 0 |

12.3 COMPANY EXPERIENCE

12.3.1 Service providers should have at least recent five (5) years of experience in the nuclear energy sector, preferably with demonstrated expertise of developing financial models; and meet the following requirements and expertise:

12.3.1.1 Have expertise in conducting detailed costing on the amount of revenue/levies to be collected by Funds.

12.3.1.2 Have a grasp of the dynamics and challenges of the nuclear energy sector.

12.3.2 Proof must be provided from three (3) contactable references indicating that similar projects were executed.

12.4 Qualifications of Team Leader and Team Members

12.4.1 Team leader must possess at least a Postgraduate Degree in Finance or related disciplines (e.g. Business Economics).

12.4.2 Team member(s) must possess at least a Degree in Finance or related disciplines (e.g. Business Economics).

12.4.3 Curriculum Vitae and certified copies of certificates (within 3 months) of the team leader and team members must be attached to the technical proposal. Failure to attach copies, bidders will forfeit functionality point.

12.4.4 The role, location and commitment of each member in the team during the assignment must be clearly specified.

12.5 Experience of Team Leader and Team Members

12.5.1 The team leader must have at least 5 years of experience in the finance sector, and in developing financial models.

12.5.2 Team member(s) of the team should have at least 3 years of experience in the finance sector and knowledge developing financial models.

12.6 Independence

12.6.1 The service provider and all its employees must assure its independence from all government departments and related state owned entities involved with nuclear waste management.

12.7 Project Plan

12.7.1 The service provider must provide:

- a. A project proposal that demonstrates comprehension and competence to deliver on what is required in line with the scope of work under paragraph 3.

- b. A preliminary project plan outlining key activities, time frames.
- c. A schedule of resources to be committed to the project.
- d. The key milestones which will be used as a measure of performance in the project.

13 EVALUATION PROCESS

- 13.1 Quotes will be evaluated on **90/10 preference point system** as outlined in the PPPFA of 2011. The proposals will be evaluated in two phases:
Phase 1: Service providers will be evaluated based on functionality. The minimum threshold for functionality is **70 out of 100 points**. Service providers who fail to meet minimum threshold will be disqualified and will not be evaluated further for price and preference points for B-BBEE.

| Evaluation criteria | Weight |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <p>1. Company Experience</p> <p>❖ Service providers should have at least recent five (5) years of experience in the finance sector, preferably with demonstrated expertise in developing detailed costing of revenues to be collected by Funds; and meet the following requirements and expertise:</p> <p>1.1 Have expertise in the development of financial models. 13</p> <p>1.2 Have a grasp of the dynamics and challenges of the nuclear energy sector. 4</p> <p>Proof must be provided from three (3) contactable references indicating that similar projects were executed. 3</p> | 20 |
| <p>2. Qualifications and Experience of Team Leader and Team Members</p> <p>❖ Qualifications:</p> <p>2.1 Team leader must possess at least a Postgraduate Degree in Finance or related disciplines (e.g. Business Economics). 8</p> <p>2.2 Team member(s) must possess at least a Degree in Finance or related disciplines (e.g. Business Economics). 5</p> <p>2.3 The Team Leader and Team Member(s) must submit certified copies of certificates. 2</p> <p>❖ Experience:</p> <p>2.4 The team leader must have at least 5 years of experience in the finance sector. 6</p> <p>2.5 Team members should have at least 3 years of experience in finance sector. 3</p> <p>2.6 Curriculum Vitae and certified copies of certificates (within 3 months) of the team leader and team members must be attached to the technical proposal. Failure to attach CVs, bidders will forfeit functionality point. 3</p> | 15 |
| <p>3. Independence</p> <p>3.1 The service provider and all its employees must assure its independence from all government departments and related state owned entities involved with nuclear waste management. 3</p> | 3 |

| Evaluation criteria | Weight |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 4. Project Plan | 50 |
| 4.1 The service provider is expected to demonstrate how it will achieve the following (from the Scope of Work in Section 3) in its proposal: | |
| a. Benchmarking and Options Studies | 10 |
| b. Assessment | 5 |
| c. Modelling and Analysis | 10 |
| d. Conclusions and Recommendations | 5 |
| 4.2 The service providers must provide: | |
| a. A project proposal that demonstrates comprehension and competence to deliver on what is required. | 10 |
| b. A preliminary project plan outlining key activities and milestones, time frames and associated costs. | 10 |
| The key milestones will be used as a measure of performance in the project. | |
| TOTAL | 100 |

For purpose of evaluating functionality, the following values will be applicable:

| | | |
|-----------|------------------|-----------------------------------------------------------------------|
| 1= | Very Poor | Will not be able to fulfil the requirements |
| 2= | Poor | Will partially fulfil the requirements |
| 3= | Average | Will be able to fulfil the requirements |
| 4= | Good | Will be able to fulfil better in terms of the requirements adequately |
| 5= | Excellent | Will fulfil the requirements exceptionally |

Phase 2: Price and B-BBEE

| Evaluation criteria | Weight |
|----------------------------|---------------|
| Price | 90 |
| B-BBEE Compliance | 10 |

14 FORMAT AND SUBMISSION OF THE PROPOSAL

- 14.1 All official forms (SBD) must be completed in all respects by service providers. Failure to comply will invalidate a bid.
- 14.2 Service providers are requested to submit two (2) copies: 1 original plus 1 copy of the proposal and bid documents.

15 CLOSING DATE

- 15.1 Proposal must be submitted on or before **10 December 2015** at the Department of Energy, 192 Visagie Street, Corner of Visagie and Paul Kruger Street, Pretoria in the Bid Box marked Department of Energy. **No late bids will be accepted.**

16 ENQUIRIES

- 16.1 All technical enquiries to be directed in writing to Mr Katse Maphoto
Tel: 012 406 7498
Email: katse.maphoto@energy.gov.za
- 16.2 All bid enquiries to be directed to Ms Rachel Moerane or Ms Daisy Maraba
Tel: 012 406 7742/ 7748
Email: Rachel.Moerane@energy.gov.za, Daisy.Maraba@energy.gov.za